UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,047	07/14/2006	Takeki Yoshimura	0994-0249PUS1	2447

2292 7590 04/17/2009

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
NGUYEN, HUY TRAM	
ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
04/17/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/586,047	YOSHIMURA, TAKEKI	
	Examiner	Art Unit	
	HUY-TRAM NGUYEN	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,8,9 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,8,9 and 11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see the Remarks, Filed on February 12, 2009, with respect to the rejection(s) of claim(s) 1-5, 8, 9, and 11 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of **Tachibana (US Patent No. 5,738,025), Yoshimura (JP 2003-096469) and Costa et al. (US Patent No. 3,739,710).**

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Costa et al. (US Patent No. 3,739,710).**

Regarding Claim 1, Yoshimura reference discloses an oil reconversion device for waste plastics which performs thermal cracking by heating a waste plastic and converting the generated cracker gas into oil by cooling **(Abstract)**, the oil reconversion device comprising:

a thermal cracking bath **(Drawing 1, numeral 5)** which has a bath main body placed inside a coil **(Drawing 1, numeral 6)**, the thermal cracking bath being adapted to induction-heat the bath main body by feeding a high-frequency current through the coil **(Abstract and Paragraph [0006])**, and to thermally crack at least a molten plastic obtained from the waste plastic to generate a cracker gas **(Paragraph [0006] – cracked gas G)**,

an injection port through which the waste plastic is injected **(Drawing 1 and 3, numeral 28)**,

a feeder which supplies the waste plastic injected through the injection port to the thermal cracking bath via a forced or direct feeding means without a bath **(Drawing 3, numeral 72)**, and

an oil conversion processor which cools and converts the cracker gas generated by the thermal cracking bath into oil **(Drawing 1, numeral 36 – capacitor unit and Paragraph [0022] – fuel oil).**

However, Yoshimura reference does not disclose an agitating mechanism having an agitate-scraping unit located inside the thermal cracking bath being adapted to

agitate a molten plastic contained in the bath main body, and to scrape the molten plastic adhering to the inner wall of the bath main body, and the agitate-scraping unit including a heater capable of heating a top surface of the molten plastic contained in the bath main body. Costa et al. reference discloses similar agitating scraping unit inside a kettles for heating the products within a kettle by heat transfer from the inside agitator **(Abstract)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the agitating unit including a heater as taught by Costa et al., since Costa et al. reference states at **Column 1, Line 47-Column 2, Line 49** that such a modification would provide improved heat transfer between heating source and the product being processed.

1. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Costa et al. (US Patent No. 3,739,710) and Tachibana (US Patent No. 5,738,025) (Tachibana-1).**

Regarding Claim 2, Yoshimura and Costa et al. references disclose the oil reconversion device for waste plastics described in claim 1 except for an extruder having a heating cylinder and an extruding screw which melts and extrudes the waste plastic injected into the injection port. Tachibana reference discloses a similar apparatus for thermal cracking of waste plastics having an extruder for crushing and melting and extruding the waste plastic into the thermal cracking vessel **(Figure 2, numeral 2 and Column 3, Line 39-46)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the extruder of Tachibana in the

modified device of Yoshimura since it was known in the art to feed plastics by use of an extruder.

2. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Costa et al. (US Patent No. 3,739,710) and Tachibana (JP 11-005984) (referred as Tachibana-2).**

Regarding Claim 3, Yoshimura and Costa et al. references disclose the oil reconversion device for waste plastics described in claim 1 except for a hopper to inject the waste plastic into the bath main body, which has an open/close cap to open/close the injection port of this hopper and to open/close an injection path between the hopper and the bath main body, and an air feeding port capable of sending an inert gas into the hopper. Tachibana-2 reference discloses the similar oil reconversion device for waste plastics comprising a hopper **(Figure 1, numeral 102)**, a nitrogen gas inlet **(Figure 1, numeral 103)** and valves **(Figure 1, numerals 105 A, B and C).** It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the injecting means as taught by Tachibana-2 for transporting and melting the waste plastics before injecting the waste plastics into the bath main body/thermal cracking vessel since their use of either one of the structures in the relevant art and the selection of any of these known equivalents to each other would be within the level of ordinary skill in the art.

Regarding Claim 4, Yoshimura, Costa et al. and Tachibana-2 references disclose the oil reconversion device for waste plastics described claim 3 wherein the waste plastic injector has an injection pipe composing the injection path and wherein an

open/close valve and an open/close damper are connected to the injection pipe between the bath main body and the open/close valve **(Tachibana-2 - Figure 1, numerals 105A, B and C).**

Regarding Claim 5, Yoshimura, Costa et al. and Tachibana-2 references disclose the oil reconversion device for waste plastics described in claim 3 wherein the thermal cracking bath also functions as the melting bath which melts the waste plastic **(Yoshimura - Abstract).**

3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469), Costa et al. (US Patent No. 3,739,710) in view of Jiang (US 2002/0156332 A1).**

Regarding Claim 8, Yoshimura and Costa et al. references disclose the oil reconversion device for waste plastics described in claim 1 further comprising a residue processor which collects and heats residue plastic generated inside the bath main body **(Yoshimura - Drawing 1, numeral 32 – residue treating part).** However, Yoshimura does not teach that the residue treating part is used to heat and supply a generated cracker gas to the oil conversion processor. Jiang reference discloses a system for converting waste plastics into hydrocarbon oil in a continuous processing step **(Figure 1)**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to further heat and thermally crack the residue to generate additional cracking gas and send the cracking gas to the oil conversion processor for producing the fuel oil **(Jiang - Page 1, Paragraph [0008]).**

4. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshimura (JP 2003-096469) in view of Costa et al. (US Patent No. 3,739,710) and Sugiyama (JP 2002-309270).**

Regarding Claims 9 and 11, Yoshimura and Costa et al. references disclose the oil reconversion device for waste plastics described in claims 1 and 8 respectively except for an off-gas processor having a burn processor which burns an off-gas generated in the processes of sequentially processing the waste plastic at a specified temperature or higher. Sugiyama reference discloses the burner for burning off the off gas generated in the process **(Paragraph [0017])**. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermal cracking device of Yoshimura with the burner of Sugiyama since it was known in the art to burn off the off gas from the thermal cracking process of waste plastics to produce harmless gas which is environment friendly.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUY-TRAM NGUYEN whose telephone number is (571)270-3167. The examiner can normally be reached on MON- THURS: 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HTN
4/10/09

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797